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**Topic of Research:** High throughput screening for identification of antimicrobial compounds from medicinal plants of India

### **Findings**

The study discovered significant data about the antibacterial capabilities of Indian medicinal plants against drug-resistant bacterium strains. Particularly, extracts from *Andrographis paniculata*, *Berberis aristata*, and *Pistacia integerrima* were susceptible to *E. coli* and *S. aureus*, with minimum inhibitory concentrations (MIC) ranging from 5 to 10 mg/mL and minimum bactericidal concentrations (MBC) reaching 20 mg/ml. The extracts were discovered to disturb the typical growth patterns of these bacterial strains, indicating a bacteriostatic rather than bactericidal impact, since the population decrease did not exceed 3 Ln CFU/mL. Furthermore, the study revealed the ability of these plant extracts to improve the efficiency of conventional antibiotics such as ampicillin, indicating a synergistic interaction, notably between *Berberis aristata* extract and ampicillin against *E. coli*. This interaction highlights the potential for mixing plant-derived molecules with current medicines to address antibiotic resistance more effectively. The loss of bacterial cell wall integrity, as demonstrated by enhanced permeability and the release of internal components, as well as the suppression of biofilm formation, indicate the mechanisms by which these extracts exert their antibacterial actions. The discovery of bioactive substances such as andrographolide, berberine, and quercetin using a variety of analytical methods, including GC-MS and LC-MS, gives a molecular foundation for the effects. Furthermore, computational studies on enzyme inhibition help to understand the compounds' potential as antibacterial agents. This comprehensive approach not only verifies the antibacterial capabilities of these plant extracts, but also lays the groundwork for future research targeted at using their qualities for medicinal purposes.